Montana Office of Public Instruction
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www.opi.mt.gov/IndianEd

Mathematics Lesson Plan

Beading Input/Output Tables

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Grade 3: Duration 60-90 minutes

Stage 1 Desired Results

Established Goals:

Montana Content Standards: 3.2 Represent situations and number patterns using tables
Essential Understanding 1: There is diversity between the 12 tribal nations and their cultures.
Essential Understanding 3: Native traditional beliefs persist into modern day life.

Understandings:	Essential Questions:
1. Beading is important in many American Indian cultures, both present day and in the past 2. Patterns can be generalized to an algebraic rule	1. To what extent has beading played a role in some American Indian cultures? 2. How many projects would someone need to sell to make a profit?
Students will be able to… 1. Complete in/out tables and generalize each table to a rule *2.* Analyze data and draw conclusions from the information	*Students will know…* 1. The importance of beading in some American Indian cultures 2. Vocabulary: beading; profit; loss; in/out tables

Stage 2 Assessment Evidence

Performance Tasks:

*****Students will complete a beading pattern and find the in/out table values for the entire class.

Other Evidence:

*Students will complete in/out tables and generalize to a rule as a whole group, in partners, and on their own.

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Beading Tables

Stage 3 Learning Plan

1. Discuss the history of beading in the Native American culture (see top of worksheet 1) as well as its importance in today's culture. Beading is used as a decoration on clothing for pow wows and other gatherings. It is also used as an income source for Native Americans. They sell their items locally at pow wows and gatherings, as well as across the nation through websites and catalogues.
2. Today we are going to complete in/out tables based on the number of beads needed for different projects. Show examples of different beaded projects (see attachment A, B and C). We want to see how many beads will be needed for different projects.
3. We are going to look at a key ring project. (show example) How many beads does it take to make one choker? (25) What if I made two chokers, how many beads will I need? (50) How did you find your answer? (Take different responses: I added 25; I multiplied 25 by 2; I doubled 25, etc.)
4. What if I make 3 chokers, how many beads will I need? (75) How did you find your answer? (added another 25; multiplied 25 by 3) Did doubling the previous answer work? (No) Why not? (because you can only add 25 this time, not 50; since it is 25 per choker)
5. Continue with the table until students understand how to compute each output value.
6. Show examples of the choker and bracelet. Have students work on tables 2 and 3 with a partner. Share responses as a whole group. What patterns are you noticing about your tables? (the input increases by one; the output increases by the value of the number of beads)
7. Show the necklace pattern. Tell students that this time there is 2 different things to compute… the number of beads and the number of shells needed to complete the necklace. As they are working on the table, encourage them to look for patterns. As students work independently, circulate and ask individual students about the patterns they are seeing as they find the beads, the shells and the totals. See if students recognize that the total is increasing by 82 each time and why that is. (50 + 32 = 182)
8. Give students a piece of paper (some students may need graph paper) and have them create their own bead pattern for a bracelet, necklace, choker or other item.
9. After their pattern is complete, ask them to complete an in/out table for the number of beads that they used.
10. Summarize the lesson: When we have in/out tables, what are we doing? (finding the output value, based on the rule of the table) What were some of the rules for our tables? (add 25, add 50, add 700, etc.) For the students that were multiplying to get their output values, show them the expression that correlates with each table (25n; 50n; 700n; etc.)
11. What did you notice about the total on the last table? (it increased by 82 each time). Why 82? (50 beads and 32 shells)

Materials/Resources Needed: paper; colored pencils; American Indian beadwork background information sheet, Beading In/Out Worksheet; Attachments A-C

http://www.nocbay.com/learningcircle/index.html

Name: _____

American Indian Beading

Originally, American Indian beads were carved out of many materials such as shells, turquoise and other stones, as well as many other materials found naturally in the environment. Once Europeans brought glass beads, they became a part of the American Indian **culture.** However, beads were common trade items between American Indian Nations, even before Europeans arrived. Today glass beads are the main materials for traditional beaders of many tribes.

There are many different American Indians beading traditions as there are tribes and nations. **Plains Indians** beadwork is best known. One form of beading, beaded strands, is usually used for jewelry, but can be used as part of a ceremonial ornamental coverings or art object. When using beaded strands, American Indians stitch the beads together into strings or **mesh**, using **sinew**, thread or wire. Beading strands is a complicated, time-consuming and delicate task which takes many years of practice to do well.

Table 1: To bead a key ring, you will need 25 beads. Fill out the In/Out Table for beading key rings.

Number of Key Rings Beaded	Number of Beads Needed
1	25
2	
3	
4	
5	

Rule: _____

Table 2: To bead a choker, you will need 150 beads. Fill in the In/Out Table for beading chokers.

Number of Chokers Beaded	Number of Beads Needed
1	150
2	
3	
4	
5	

Rule: _____

To bead a bracelet, you will need 700 beads. Complete the input/output table. Look for patterns as you are completing it.

Number of Bracelets Beaded	Number of Beads Needed
1	700
2	
3	
4	
5	

Rule: _____

To bead a necklace, you will need 50 beads and 18 shells. Complete the input/output table. Look for patterns as you are completing it.

Number of Necklaces Beaded	Number of Beads Needed	Number of Shells Needed	Total Number of Materials
1	**50**	**18**	**68**
2			
3			
4			
5			

Rule: _____